

What is claimed is:

1. A direct current motor comprising a yoke housing and an armature rotatably received within said yoke housing, said yoke housing comprising:

a plurality of primary magnetic poles secured to an inner peripheral surface of said yoke housing for providing magnetic fields to said armature; and

a plurality of groove-like reduced thickness portions for increasing a magnetic resistance, said plurality of groove-like reduced thickness portions being integrally formed in said yoke housing, wherein:

a number of said plurality of groove-like reduced thickness portions is equal to a number of said plurality of primary magnetic poles; and

each said groove-like reduced thickness portion extends along a center line of a corresponding one of said plurality of primary magnetic poles.

2. A direct current motor according to claim 1, wherein each said groove-like reduced thickness portion is formed by recessing one of an outer peripheral surface and said inner peripheral surface of said yoke housing.

3. A direct current motor according to claim 1, wherein each said primary magnetic pole is configured such that said center line of each said primary magnetic pole extends linearly in an

axial direction of said yoke housing.

4. A direct current motor according to claim 1, wherein each said groove-like reduced thickness portion extends from one of opposing axial ends of said yoke housing for a length that covers an entire axial length of said corresponding one of said plurality of primary magnetic poles.

5. A direct current motor according to claim 1, wherein:

said yoke housing is formed as a generally oblate cylinder that includes opposing generally parallel flat sections and opposing arcuate sections; and

each said arcuate section has one of said plurality of primary magnetic poles secured to an inner peripheral surface of each said arcuate section.

6. A direct current motor according to claim 5, wherein said yoke housing is configured such that a wall thickness of each said flat section is larger than a wall thickness of each said arcuate section.

7. A direct current motor according to claim 5, wherein said wall thickness of each said arcuate section gradually increases from a circumferential center of each said arcuate section toward each one of opposing circumferential ends of each said arcuate section.

8. A direct current motor according to claim 1, wherein said plurality of primary magnetic poles include permanent magnets.

9. A direct current motor according to claim 5, wherein a wall thickness of each said groove-like reduced thickness portion is equal to or less than 40% of a wall thickness of each said flat section.

10. A yoke housing of a direct current motor that includes an armature rotatably received within said yoke housing, said yoke housing comprising:

a plurality of primary magnetic poles secured to an inner peripheral surface of said yoke housing for providing magnetic fields to said armature; and

a plurality of groove-like reduced thickness portions for increasing a magnetic resistance, said plurality of groove-like reduced thickness portions being integrally formed in said yoke housing, wherein:

a number of said plurality of groove-like reduced thickness portions is equal to a number of said plurality of primary magnetic poles; and

each said groove-like reduced thickness portion extends along a center line of a corresponding one of said plurality of primary magnetic poles.

11. A method for manufacturing a yoke housing of a direct current motor according to claim 1, said method comprising:

forming said plurality of groove-like reduced thickness portions in said yoke housing by pressing a die along a surface of said yoke housing in a direction axially parallel to said yoke housing, said die being also used for forming at least a portion of a rest of said yoke housing.

12. A method according to claim 11 further comprising simultaneously forming said plurality of groove-like reduced thickness portions together with forming at least said portion of the rest of said yoke housing.